Graduate Programs in Engineering

The College of Engineering offers a Master of Science in Engineering, a Master of Science in Engineering Management and a Ph.D. in Engineering and Applied Sciences, allowing applicants with various backgrounds and goals to be accommodated.

Master of Science in Engineering

**Student Learning Outcomes**

**College of Engineering**

**M.S. in Engineering**

1. Application of mathematics, science, and engineering to solve significant engineering problems.
2. Professional development and enhancement of technical communications.
3. M.S. graduates will qualify for above-entry-level jobs in industry or in continuing their graduate education at the PhD level.

**Admission**

Applicants seeking admission to a graduate program in engineering must have received a bachelor's degree in a field of engineering from an ABET accredited engineering or closely related program or, in the case of foreign students, must present evidence of an equivalent preparation. Furthermore, applicants are expected to have a grade-point average (GPA) of 3.0 or better for undergraduate work and all graduate and post-bachelor work. Applicants who have an undergraduate GPA between 2.5 and 3.0 may be considered for admission on a case-by-case basis which will include a review of their last 60 hours of engineering course work and GRE scores. In addition, the student is required to complete the GRE prior to consideration with scores indicating that the student will perform well in a strong graduate program.

Furthermore, all students must complete all requirements for the graduate courses in which they wish to enroll, and must meet any additional general requirements as stipulated by the Graduate School and the College of Engineering.

**Applicants without an Undergraduate Degree in Engineering**
Applicants with Bachelor of Science degree in mathematics, the sciences, or other undergraduate degrees will be considered on a case-by-case basis. Such students must complete a core program specific to each department including any prerequisite for each or pass the equivalent credit examinations with a grade of “B” or better. Such students would be best advised by the particular department in which they seek to enroll.

**Degree Requirements**

After admission, students are required to select an area of concentration (either civil/environmental, electrical, mechanical, or naval architecture and marine engineering). A choice is provided between a thesis or a research program, calling for 30 hours of graduate credit, including six hours of thesis research; and a non-thesis option, requiring 33 hours of graduate credit.

Concentrations are allowed in the following areas:

- Civil/Environmental Engineering
- Electrical Engineering
- Mechanical Engineering
- Naval Architecture and Marine Engineering

**Master of Science in Engineering Management**

The College of Engineering offers an M.S. degree in Engineering Management. This program makes use of the expertise and resources of the faculty of both the College of Engineering and the College of Business Administration. This program is intended for engineers who wish to remain in their engineering area of expertise but desire to improve their managerial skills and their understanding of business practices.

**Student Learning Outcomes**

**College of Engineering**

**M.S. in Engineering Management**

1. Demonstrate knowledge of engineering management methods for use in technology organizations.
2. Demonstrate knowledge of technical organizations at a strategic level, and the role and practices of the various business functions.
3. Demonstrate the ability to use modern tools for effective engineering management.
4. Demonstrate the ability to communicate effectively.
Admission

Students admitted into the master of science of engineering management must possess an undergraduate degree in engineering. Applicants are expected to have an undergraduate GPA of at least 3.0. Applicants who have an undergraduate GPA between 2.5 and 3.0 may be considered for admission on a case-by-case basis which will include a review of their last 60 hours of engineering course work and GRE scores. In addition, the student is required to complete the GRE, prior to consideration, with scores indicating that the student will perform well in a strong graduate program.

Degree Requirements

Both the Non-Thesis and Thesis options are available for the degree of Master of Science in Engineering Management:

Non-thesis Option

Completion of 33 credit hours including 18 credit hours of required core courses and three credit hours for a capstone course. The remaining 12 credit hours must be selected from approved electives.

Thesis Option

Completion of 30 credit hours including six credit hours of thesis research, and 18 credit hours of required core courses. The remaining six credit hours must be selected from approved electives.

Doctor of Philosophy in Engineering and Applied Science

The Doctor of Philosophy in Engineering and Applied Science is an interdisciplinary, integrative degree involving faculty from the College of Engineering and the College of Sciences. The program is designed for those engineers who will extend the frontiers of engineering. The graduate will have knowledge that is both broad in fundamentals as well as strongly focused in the area of his/her research. Research is the centerpiece of a Ph.D. program. It is expected that the graduate’s research will substantially expand the knowledge of the engineering profession.

Student Learning Outcomes
College of Engineering
Ph.D. in Engineering and Applied Science

1. Ability to apply basic engineering concepts as demonstrated by the results of the Qualifying Procedures
2. Ability to apply advanced concepts, both Colleges to develop Ph.D. Research
3. The candidate will have the approval of the Ph.D. Dissertation Committee for the scope of the Ph.D. Dissertation
4. Ability to perform advanced engineering and/or science research
5. Ability to publish research
6. Final approval of the Ph.D.

Admission

Admission to the doctoral program is based on reasonable evidence that the applicant will prove capable of scholarly research on a broad intellectual foundation. All students enrolling in the program must have a Master’s degree from an accredited college or university in engineering, physics, mathematics, earth and environmental sciences, computer science, or a closely related field, or be willing to complete coursework required in an existing Master’s program in one of the participating departments at UNO while pursuing the Ph.D. Admission decisions will be based primarily on grade-point average, Graduate Record Examination scores, and letters of recommendation. Foreign applicants (non-English speaking countries) must also provide proof of English proficiency.

Degree Requirements

Following are the formal procedural requirements for students to receive the Ph.D. degree in Engineering and Applied Science.

Ph.D. candidates must complete a minimum of 51 semester credit hours of graduate course work in an approved program beyond the Bachelor's degree, not including dissertation research. The credit hours may include up to 30 semester hour credits obtained in a Master’s degree program, if the area of the Master’s degree is relevant to the doctoral program. Up to six of these 30 credits may be for thesis research. In addition at least 30 semester hours of dissertation research credit must be earned. A doctoral dissertation based on the results of original research under the guidance of a faculty committee and defended in a public examination is required for the completion of the doctoral program.

Departments participating in the program are Civil and Environmental Engineering, Electrical Engineering, Engineering Management, Mechanical Engineering, Naval Architecture and Marine
Engineering, Computer Science, Earth and Environmental Sciences, Mathematics, and Physics. The student's dissertation advisory committee will consist of at least five members. No more than three can be from any one department. There must be at least one committee member from each of the colleges of Engineering and Sciences. Program qualification, in the form of a Qualifying Examination, is administered by the department of the principal advisor(s). It is based on material in a typical departmentalized master's degree program, or equivalent. Courses are chosen with the consent of the dissertation advisory committee. The committee shall consider the interdisciplinary nature of the program when it approves the courses. A minimum of nine credits (three courses) must be taken in each college. A General (comprehensive) Examination will be administered by the dissertation advisory committee. The examination will be based on material in the student's program of study. After passing the General Examination the Ph.D. student is expected to write a dissertation prospectus and defend it before the dissertation advisory committee. After a successful defense and committee approval of the prospectus, the student may pursue research leading to the dissertation. (The student must register for a minimum of 12 dissertation credits before successful defense and approval of the prospectus provided that Program Qualification has been successfully completed.) The dissertation should reflect the interdisciplinary nature of the program. There must be a final public defense of the dissertation administered by the dissertation advisory committee.

Financial Aid

Teaching and research assistantships are available to qualified graduate students on a competitive basis.